

## **VENT STAY FOR A CANOPY OR TENT**

### **TECHNICAL FIELD OF THE INVENTION**

(0001) The present invention is directed to tents or canopies, and more specifically to a vent for use with a tent or canopy.

### **BACKGROUND OF THE INVENTION**

(0002) Camping is a popular recreational activity enjoyed by many. Some people camp so that they may enjoy the outdoors, and others use camping as an inexpensive alternative to staying in a hotel.

(0003) Often campers stay in a tent, either in a campsite, or in a suitable location somewhere outdoors. In general, a tent is a collapsible shelter, which typically is made of a tough fabric or plastic and is held up by poles or another suitable structure.

(0004) Because a tent is often a closed structure, often the air within the tent becomes stale. Condensation, stale air, and aroma from a fetid tentmate is often expelled by providing tent ventilation. This ventilation can be provided, for example, by keeping the doors slightly open or by having windows in the tent. More recently, tents have been

designed so they have a mesh top and a rain fly that extends over the tent and is spaced from the mesh top by the pole structure for the tent. In theory, the air flows out of the tent through the mesh material at the top of the tent and into the area between the rain fly and the tent. This air then circulates out from under the rain fly.

(0005) Although the mesh and rain fly construction of tents works well, the rain fly does not always provide optimal ventilation. Often, the rain fly extends almost to the ground and if a breeze is not directed properly between the tent and the rain fly, the air and condensation may still accumulate underneath the rain fly and proper ventilation may not be supplied.

(0006) Another structure that is often used while camping is a canopy. In general, a canopy is a covering that is put above something else to provide shelter. For camping, canopies are typically made of fabric and are designed to be removed and to be folded into a compact configuration for storage. A canopy may or may not have walls, such as screen walls. A canopy may be, for example, set up over a picnic area, used adjacent to a tent for a storage area, serve as a shelter from the rain, or used as a screened area to avoid bugs.

(0007) Canopies also need ventilation. In general, canopies have an apex and two or more sides that extend down from the apex and that are attached to poles or another support. Condensation and stale air can accumulate under this apex. In addition, in warmer weather, the environment under an unvented canopy can become rather warm.

(0008) To address ventilation and air movement in canopies, vents have been used at the apex of the canopies to allow better ventilation. In one prior art example, a vent was provided in which a portion of the canopy includes an opening or a slit that extends horizontally. The upslope portion of the vent was held upward and was spaced from the lower portion so as to form an opening.

(0009) In one version of this type of vent, a closed cell polyethylene plastic strip was sewn into the hem of the vent, on the upper sections. The plastic strip was permanently installed, but was flexible and resilient. It theory, the vent's resiliency caused the vent to stay open during use, and its flexibility permitted the canopy to be folded with the vent collapsed. One problem with this particular vent structure was that the flexibility of the plastic strip often caused it to have a poor appearance or to collapse during wind or rain, preventing air from moving

through the vent. Thus, the desired effect of ventilation was eliminated.

(0010) A similar vent was utilized for the rain fly on a prior art tent. The stay for these tent vents included two strips, one each attached to the upper and lower hems of the vent opening. Each of the strips was formed of a stiff, rigid material sewn into the fabric. One of the strips had hook fastener material and the other had loop fastener material. The two strips were attached to each other and were used to space the upper and lower sections of the vent opening apart. They were then detached so that the rain fly may be stored.

(0011) Although the vents for rain flies described above worked well for their intended purpose, in practice, users often forgot to connect the two fasteners to one another prior to assembling the tent. Reaching the fasteners after the tent was assembled was difficult, if not impossible, and thus the user may have had to remove the fly to fasten the two strips.

## SUMMARY OF THE INVENTION

(0012) The following presents a simplified summary of some embodiments of the invention in order to provide a basic understanding of the invention. This summary is not an extensive overview of the invention. It is not intended to identify key/critical elements of the invention or to delineate the scope of the invention. Its sole purpose is to present some embodiments of the invention in a simplified form as a prelude to the more detailed description that is presented later.

(0013) In accordance with one embodiment, a flexible stay is provided for a tent or canopy. The flexible stay is connected to upper and lower sections of a vent, and is formed of a construction that is resilient enough to support the vent during use, but is flexible enough so that the vent may be collapsed during storage.

(0014) In accordance with one embodiment, the flexible stay is formed of a series of rigid material segments with a hole through each segment. The segments may be, for example, wooden beads, ceramic beads, or cut-to-length pieces of fiberglass tent rods. Each segment includes a hole extending therethrough, and the segments are held together with an

elastic cord that is tied or otherwise fastened at the ends of the distal segments.

(0015) Preferably, the segments each have flat surfaces on adjacent facing edges that extend parallel to one another with the holes extending through the surfaces at a direction perpendicular to the surfaces. The cord that extends through the sections is stretched before it is fastened so as to give the stay the resilience needed to hold the vent open when deployed. The ability of the cord to stretch when the canopy or tent is being stored allows the stay to collapse.

(0016) In accordance with another embodiment, the stay is positioned within a material sleeve. The sleeve is arranged and configured so that it is sufficiently large to permit the stay to bend and collapse during storage. The material for the sleeve may be the same as the material as the canopy or tent to which the stay is attached, or may be a different type of material. In addition, even if the same material, the sleeve may be a different color than the material for the canopy or the tent.

(0017) In accordance with another embodiment, a vent is provided on the lower portion of a tent. The lower portion is formed of a water-repellent material, and mesh material is

provided at an upper portion of the tent. The vent may or may not use the stay described above.

(0018) Other features of the invention will become apparent from the following detailed description when taken in conjunction with the drawings, in which:

**BRIEF DESCRIPTION OF THE DRAWINGS**

(0019) FIG. 1 is a side perspective of a tent incorporating an embodiment of the present invention;

(0020) FIG. 2 is a cut-away view of the tent of FIG. 1;

(0021) FIG. 3 is a detailed view of a top portion of the tent of FIG. 1; and

(0022) FIG. 4 is an exploded perspective view of a stay for use in the tent of FIG. 1 in accordance with an embodiment of the invention.



### **DETAILED DESCRIPTION**

(0023) In the following description, various embodiments of the present invention will be described. For purposes of explanation, specific configurations and details are set forth in order to provide a thorough understanding of the embodiments. However, it will also be apparent to one skilled in the art that the present invention may be practiced without the specific details. Furthermore, well-known features may be omitted or simplified in order not to obscure the embodiment being described.

(0024) Referring now to the drawings, in which like reference numerals represent like parts throughout the several views, FIG. 1 shows a tent 20 having a rain fly 22, each of which incorporates a vent in accordance with an embodiment of the present invention. The rain fly 22 covers the tent 20 and forms a front vestibule 24 and a rear vestibule 26 for the tent 20.

(0025) As is known, modern tents (e.g., the tent 20) typically include a pole structure 28 (end of the poles for the structure are shown in FIG. 1) for supporting the tent. The tent 20 is typically spaced downward from the pole structure 28, for example by extending poles for the pole structure through sleeves (not shown) on the tent, and

anchoring ends of the poles so that the tent is supported thereby. Alternatively, the pole structure 28 may be erected so that the tent 20 is attached to and hangs down from the poles, for example by hooks. The rain fly 22 is supported across the top of the pole structure 28, and may additionally be attached to the ground by stakes (not shown, but known in the art).

(0026) Although described with respect to a modern tent 20, features of the present invention may be utilized in many different structure of tents, including the rain fly 22 of a tent, or in a canopy or any other fabric structure that would benefit from ventilation.

(0027) In accordance with one embodiment, a vent 30 is positioned at a top portion of the rain fly 22 for the tent 20. The vent 30 includes an upper flap 32 that is separated from a main body of the tent 20. The upper flap 32 includes an outer seam 34.

(0028) The vent 30 also includes an inner flap 36, typically made of the main section of the rain fly 22. The inner flap 36 includes an inner seam 38. If desired, as shown in FIG. 3, the inner flap 36 may be attached to a mesh portion 37 of the rain fly 22. The mesh portion 37 extends under the upper flap 32, and may serve to prevent insects from entering

the vent 30, and may aid in maintaining the shape of the rain fly 22. Alternatively, the rain fly 22 may be open (i.e., no mesh or other material) under the upper flap 32. Preferably, in either configuration, the inner flap 36 extends beneath the upper flap 32 a sufficient amount so that rain is prevented from falling through the vent 30 and onto the tent 20.

(0029) The structure of the tent 20, rain fly 22 and vent 30 positioned on a rain fly (e.g., the rain fly 22) is known. However, in accordance with an embodiment of the invention, a novel stay 40 is provided for maintaining the vent 30 in an open position.

(0030) In accordance with an embodiment of the invention, the stay 40 is a flexible, resilient structure. The stay 40 is flexible in that it is capable of being bent or collapsed so that the vent 30 may be folded for storage. The stay 40 is resilient in that it is biased toward a position where it holds the vent 30 open. In accordance with one embodiment, the stay 40 is biased into a straight configuration, and bends so as to permit the vent 30 to collapse for storage.

(0031) In the embodiment of the stay 40 shown in FIG. 4, the stay 40 includes a plurality of rigid segments 42 (in the embodiment shown, four). The rigid segments 42 in the

shown embodiment are all shaped similarly, but may be shaped differently. For example, the rigid segments 42 in the embodiment shown are round in cross section, but alternatively may all have a different cross section, or each may have different cross sections (one or more of which may be round). In addition, the rigid segments 42 in the embodiment shown are the same length, but again, the rigid segments 42 may be of varying lengths.

(0032) Each rigid segment 42 includes a lower surface 44 and an upper surface 46. In accordance with an embodiment of the invention, the upper and lower surfaces 44, 46 are flat and parallel to one another. This feature permits pressure applied at both ends of the stack of rigid segments 42 to bias the rigid segments 42 toward alignment. Although described as flat and parallel, other configurations may be presented on the upper and lower surfaces 44, 46 so as to bias the rigid segments 42 in a desired alignment when pressure is applied. In addition, although described as "rigid," the segments 42 may be compressible, deformable, and/or soft.

(0033) In accordance with an embodiment of the invention, an elastic cord 48 extends through each of the rigid segments 42. The elastic cord 48 may be a flexible or otherwise elastic cord, such as a shock cord or a small bungee

cord. The elastic cord 48 is stretched slightly to put slight tension on the stack of rigid segments 42. Knots or other holding mechanisms may be utilized at each end of the elastic cord 48 for holding the elastic cord 48 in position. The knots at the ends of the elastic cord 48 are attached so that the stay 40 is positioned to maintain the vent 30 in an open configuration. For example, the knots may be attached to the outer seam 34 and the inner seam 38. Alternatively, the elastic cord 48 and rigid segments 42 may be loosely held within a material sleeve 50 (FIG. 4), as further described below.

(0034) The elasticity of the elastic cord 48 biases the rigid segments 42 together. In addition, flat, parallel contours on the upper and lower surfaces 46, 44 of the rigid segments 42 cause the bias of the elastic cord 48 to align the rigid segments 42. In this manner, the resilience of the stay 40 is provided. In addition, because the elastic cord 48 is flexible, the rigid segments 42 may be bent relative to one another, such as is shown in phantom in FIG. 4. In this manner, the elastic cord 48 provides the flexibility of the stay 40.

(0035) As an example, the elastic cord 48 may be a shock cord sized at 3.5 mm diameter and rated at a minimum

strength of 65 lbs. per ASTM D5036-95. Such a shock cord is a commodity item. The shock cord may be tensioned, for example by stretching it to 200 to 250 percent of its unstretched length and then tying the ends.

(0036) Other mechanisms may be provided for providing the resilience and flexibility of the stay 40. For example, similar rigid segments 42 may be used, with a spring (not shown) or some other tensioning device, other than the elastic cord 48, that biases the rigid segments into a particular configuration. In addition, if desired, modified rigid segments 42 may be used that are configured under bias to align along a curve or in some other configuration other than a linear configuration. However, the particular configuration shown in FIG. 4 of the stay 40 works particularly well in that it aligns to provide substantial support for the vent 30, yet can collapse by the stay 40 bending as needed so that the vent 30 may be collapsed for storage.

(0037) In accordance with an embodiment of the invention, the material sleeve 50 is provided that fits over the rigid segments 42 and the elastic cord 48. The material sleeve 50 provides a more aesthetically pleasing look for a stay 40, and also prevents any pinching hazard or accumulation of dirt or grime around the stays 40.

(0038) The material sleeve 50 is preferably large enough to allow the rigid segments 42 to bend relative to one another within the sleeve 50 and to allow the rigid segments and the sleeve to collapse with the vent 30 during storage. If desired, the ends of the material sleeve 50 may be attached to the upper flap 32 and the lower flap 36, with the rigid segments 42 and the elastic 48 captured loosely inside the sleeve. The elastic cord 48 may alternatively be attached to the upper and lower flaps 32, 36. However, by not attaching the elastic cord 48, the stay 40 may have more flexibility in collapsing, permitting the vent 30 to be folded in a more efficient manner.

(0039) The ends of the material sleeve 50 may be sewn into the rain fly 22 or may otherwise be attached as needed. Material for the material sleeve 50 may be the same as the material for the rain fly 22, but a different material may be used, or the same material may be used with a contrasting color.

(0040) The stay 40 of the present invention may be utilized for a vent 30 for a rain fly 22 as described above, and as such provides a convenient structure that supports the vent 30 during use, and bends to permit the vent to collapse for storage. One or more vents 30 incorporating the stay 40

may be provided on a rain fly 22, other places on a tent 20 (described below), a canopy or any other suitable fabric structure. In addition, in accordance with one embodiment, a vent 30 may incorporate more than one stay 40.

(0041) In accordance with an embodiment of the invention, as shown in FIGS. 1 and 2, a vent 60, similar to the vent 30 may be provided on a tent such as the tent 20. The vent 60 preferably includes a stay 62 similar to the stay 40. The vent 60 may alternatively use a different type of stay, and the embodiment of the invention utilizing the vent 60 in the tent 20 may also be utilized with a rain fly 22 having a vent utilizing a different type of stay or not having a vent at all.

(0042) The vent 60 is located on a lower portion 62 of the tent 20. In the embodiment shown, two vents 60 are used, but one or more than two may be provided. The vents 60 in the embodiment shown are each located centrally on a side of the lower portion 62, but alternatively may be located anywhere on the lower portion, including the back or front of the tent 20, or at other locations along one or both of the sides. The vents 60 are arranged so that the open side of the vent faces downward, preventing water from flowing down the lower portion 62 and into the tent 20.



(0043) An upper portion 64 of the tent 20 includes mesh, in a manner known in the art. As used herein, "mesh" is meant to encompass a material that has at least some open texture, allowing for circulation of air through the material. Contemporary tents usually do not include mesh adjacent to the lower portion 62 of the tent, because water or mud may splash up on the tent and through the mesh. To this end, the lower portion 62 typically is formed of a water-repellent material.

(0044) The vent 60 enhances circulation for the tent 20 when used with or without the rain fly 22. If used without the rain fly 22, air can enter or exit the vent or vents 60 and flow to or from the mesh upper portion 64. If the rain fly 22 is used, the rain fly 22 is spaced from the tent 20, and air is permitted to flow therebetween, and out of the vent or vents 30. However, with the additional vents 60, air is also permitted to flow into a lower part of the tent 20 and out of the mesh upper portion 64 positioned at the top of the tent 20. The addition of the vents 60 permits even more ventilation than is available for a tent having only the mesh upper portion 64, in that air is permitted to enter in the lower portions of the tent 20 via the vents 60 and then exit at the upper portions of the tent 20 through the mesh top 64. Air exiting the mesh upper portion 64 may then exit through

the vents 30 in the rain fly 22.

(0045) The vent 60 thus provides improved ventilation for a tent, such as the tent 20. In addition, the stay 40 provides an improved vent 30 and/or 60 for a tent 20, rain fly 22, or canopy, or other cloth structure. If the stay 40 is utilized with the vent 60, support for the vent 60 is provided and the tent may be folded in a compact configuration with the stay bent.

(0046) Other variations are within the spirit of the present invention. Thus, while the invention is susceptible to various modifications and alternative constructions, a certain illustrated embodiment thereof is shown in the drawings and has been described above in detail. It should be understood, however, that there is no intention to limit the invention to the specific form or forms disclosed, but on the contrary, the intention is to cover all modifications, alternative constructions, and equivalents falling within the spirit and scope of the invention, as defined in the appended claims.

(0047) All references, including publications, patent applications, and patents, cited herein are hereby incorporated by reference to the same extent as if each reference were individually and specifically indicated to be

incorporated by reference and were set forth in its entirety herein.

(0048) The use of the terms "a" and "an" and "the" and similar referents in the context of describing the invention (especially in the context of the following claims) are to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. The terms "comprising," "having," "including," and "containing" are to be construed as open-ended terms (i.e., meaning "including, but not limited to,") unless otherwise noted. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (e.g., "such as") provided herein, is intended merely to better illuminate embodiments of the invention and does not pose a limitation on the scope of the invention unless otherwise claimed. No language in the specification should be construed as indicating any non-

claimed element as essential to the practice of the invention.

(0049) Preferred embodiments of this invention are described herein, including the best mode known to the inventors for carrying out the invention. Variations of those preferred embodiments may become apparent to those of ordinary skill in the art upon reading the foregoing description. The inventors expect skilled artisans to employ such variations as appropriate, and the inventors intend for the invention to be practiced otherwise than as specifically described herein. Accordingly, this invention includes all modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described elements in all possible variations thereof is encompassed by the invention unless otherwise indicated herein or otherwise clearly contradicted by context.